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Review

Ferns of Northeastern and Central North America, 2nd ed., by Boughton Cobb, Elizabeth Farnsworth and Cheryl Lowe. 2005. [Peterson Field Guide Series] Houghton Mifflin Co., Boston. 417 pp. $20.00.

After much too long a wait, Boughton Cobb's guide to ferns is once again available. Elizabeth Farnsworth and Cheryl Lowe are to be congratulated for rewriting, with the assistance of a host of area specialists from across North America, this new version of a familiar favorite. Species coverage in the new addition is expanded and updated, taking advantage of new discoveries and new understandings within the field of pteridology. Each taxon entry begins with nomenclature and common synonymy followed by sections on habit, ecology and range. The greatly amplified morphological characterizations that follow are broken down by character and emphasize distinctive features. Treatments generally conclude with a short, concise 'notes' section that covers especially diagnostic features, similar species and, in the case of well-understood polyploids, ancestral taxa. All in all, this second edition fulfills the presumed goal of providing an update of Cobb's original field guide.

This new *guide* is a fancier, glossier version of the original with new sketches, by co-author Elizabeth Farnsworth, to supplement the elegant simplicity of Laura Louise Fisher's original artwork. It is unfortunate that some of these newer drawings did not reproduce well and appear rather coarser than Fisher's plates. The line art is, however, reinforced with 105 illustrative color photos as well as numerous others added for art's sake. With few exceptions these photos add greatly to an appreciation of form and characteristics of the plants being illustrated.

This field guide, while a wonderful and artistic production, is not without problems. Most seriously, in my opinion, is that it suffers from a certain amount of 'unevenness' in content, format and organization. Color plates appear outside of species treatments, either with the generic treatment or following full species treatments, on those pages reserved for 'secondary species'. I get a sense that their use within the book is more opportunistic than planned: *Dryopteris* with 13 taxa has four color plates; the monotypic *Onoclea*, *Marsilea* and *Deparia* each have 2 plates apiece; and several genera, *Azolla*, *Pleopeltis*, *Pteridium*, *Schizaea*, *Ophioglossum*, *Lycopodiella*, *Psuedolycopodiella* and *Isoetes*, have no photographic plates at all. Such organizational problems are not unique to the illustrations. As part of the introductory section, for example, there is a rather nice, 5-page, illustrated introduction to fern morphology. This section, however, is not integrated with the sometimes redundant, 7-page glossary at the end of the book. In this same vein, the introductory section "Fern Habitats and Conservation" is separated from the topically associated "Ferns in Cultivation and Culture" section at the back of the book.

More problematic perhaps is the uneven species treatments found in many genera. As an example, the *Adiantum* treatment, covering four species, consists of two full pages for *Adiantum pedatum* and two interrupted pages for the remaining three. Admittedly those three species are rare, but perhaps no more so than *Asplenium scolopendrium*, with two full pages of coverage. Similar discrepancies in treatment can be found in other genera. Taxonomic inequity is a problem at the generic level as well, although here it is a matter of circumscription rather than coverage. This is seen especially clearly toward the end of the book where the classic genus *Lycopodium* is split, not into three genera as in many modern treatments such as the *Flora of North America*, but into seven, including the most recent segregates *Dendrolycopodium* and *Spinulum*. Morphological and molecular data sets are available that clearly show that these splinter genera are monophyletic, but the ability to split does not translate into the requirement to do so. Current trends to treat all monophyletic groups at the generic or familial rank, while transmitting a certain set of phylogenetic information, completely ignore phylogenetic relationships at other hierarchical levels. With the generic concept in the new edition, we lose sight of the group relationships among *Diphasiastrum*, *Lycopodium*, *Spinulum* and *Dendrolycopodium* and between *Lycopodiella* and *Pseudolycopodiella*. The stated argument for segregate genera is far from compelling: "These relatively new generic names [*Spinulum* and *Dendrolycopodium*] may not yet be familiar to many botanists, but we expect they will be more common in the next few years." The splitting evidenced in the lycopod section is in direct contrast to the situation in the Ophioglossaceae and Equisetaceae. Both of these families contain morphologically and molecularly distinct clades that are not recognized at the generic level. Instead, the genus *Botrychium* is maintained as a whole with the caveat "...in keeping with the *Flora of North America* (1993) and the majority of current treatments, we retain the species under the single genus *Botrychium*...." This lack of consistency is a problem; unnecessary splitting of genera does not help young fern students establish an understanding of rank or a feeling for groups and their relationships.

The arrangement of genera in the new edition is puzzling. The *"True Ferns"* are divided into the higher leptosporangiate ferns (+ *Osmunda*) and the succulent ferns (*Botrychium* and *Ophioglossum*). Within these two headings the genera are arranged alphabetically. The next section, *"Fern Relatives"*, is four parted and a bit more quixotic in arrangement. Part one consists of the lycopods – all those species (and genera) previously treated as *Lycopodium* in the first edition. *Equisetum*, *Isoëtes*, and *Selaginella* follow sequentially. This anomalous admixture of alphabetizing and phylogeny is discordant and misleading. On pages 11-13, the authors discuss higher-level fern relationships and clearly show the inclusion of *Equisetum* within the monilophytes; that relationship is ignored within the organizational framework of the book. Family level relationships are essentially lacking. Only occasionally are family names mentioned and so again the beginner is at a loss for organizational tools as they attempt to understand and make sense of fern diversity.

My final concern with the book is that it fails to provide a solid stepping-stone for more advanced studies of difficult fern groups. One aspect of fern biology that is downplayed is the frequency and evolutionary importance of hybridization. For serious fern students, the search for hybrid taxa in genera such as *Dryopteris*, *Cystopteris* and *Asplenium* can represent an exciting, challenging, and educational experience. The *guide's* glossary definition of "hybrid" is clear, but does not make an adequate distinction between primary hybrids and hybrid derived taxa, both of which may be important elements in fern rich areas within the area covered. In fact, as one examines species treatments across genera in which hybridization does occur, one notes that typically all of the higher ploidy taxa are called *hybrids*, and often given less coverage as a result. Such indiscriminate use of the term hybrid is confusing to the amateur and the unwary and misrepresents the actual biology of the organisms concerned. Although two (of the stated 27) hybrids are enumerated under *Dryopteris* they are provided with short, inconsequential descriptions (on the same page as two geographically peripheral fertile taxa) and are poorly, if at all, illustrated. There is no mention of other common hybrids, for example those involving *Dryopteris marginalis*, and no help provided as to how to know when one has found a hybrid. Space is of course always an issue with such field guides and the authors were undoubtedly constrained by page length.

My very first fern book was *A Field Guide to the Ferns* written by Boughton Cobb and published by Houghton Mifflin Company in 1956. My copy is from the seventh printing and as I examine this well worn book I notice years of notes, locality data, dates of my first finds of a species, and even a snippet of *Cheilanthes tomentosa* as a reminder of an exciting day in the field with Herb Wagner and Joe Beitel. I no longer use Cobb's book as the doorway into a new and exciting world, but I do use it as a reminder of youthful exuberance and exploration. Now, as new generations of burgeoning pteridologists begin their careers, they may also carry a copy of Cobb with them into the field and carefully annotate their discoveries in the pages of this new and expanded version. Although I have some disagreements with coverage and scope, I have already bought and given away several copies of this book to young fern students and I heartily recommend it as *the* starting point for young fern enthusiasts of northeastern North America.—R. James Hickey, Botany Department, Miami University, Oxford, OH 45056.